On the New Gas obtained from Uraninite.[1]

On March 28, Prof. Ramsay was so good as to send me a tube containing a new gas obtained by him from uraninite (cleveite) showing a line in the yellow which was stated to be of the same wave-length as D_3 which I had discovered in 1868. This line Dr. Frankland and myself shortly afterwards suggested might be a line of hydrogen not visible under laboratory conditions, but solar work subsequently showed that this view was untenable, although the gas which produced it was certainly associated with hydrogen.

Subsequently other chromospheric lines were found to vary with the yellow line, and the hypothetical gas which gave rise to them was provisionally named helium, to differentiate it from hydrogen.

It was therefore of great interest to me to learn whether the new gas was veritably that which was responsible for the solar phenomena in question; and I am anxious to tender my best thanks to Prof. Ramsay for sending the tube to enable me to form an opinion on this matter. Unfortunately it had been used before I received it, and the glass was so blackened that the light was invisible in a spectroscope of sufficient dispersion to decide the question.

On March 29, therefore, as Prof. Ramsay was absent from England, in order not to lose time, I determined to see whether the gas which had been obtained by chemical processes would come over by heating in vacuo, after the manner described by me to the Society in 1879, and Mr. L. Fletcher was kind enough to give me some particles of uraninite (Bröggerite) to enable me to make the experiment.

This I did on March 30, and it succeeded; the gas giving the yellow line came over associated with hydrogen in good quantity.

I have since obtained photographs of the gas, both in vacuum tubes while the Sprengel pump has been going; and at atmospheric pressure over mercury. To-day I limit myself to exhibiting two of these photographs.

One of the photographs exhibits a series of spectra taken during the action of the pump. The two lower spectra indicate the introduction of air by a leak, after the capillary had cracked near one of the platinums, giving us on the same plate the banded and line spectrum of air. These prove that there was no air present in the tube when the fourth spectrum was taken. This photograph has not yet been finally reduced, but a preliminary examination has indicated that most of the lines are due to the structure spectrum of hydrogen, but not all of them.

Among the lines which cannot be referred to this origin are two respectively near λ 4471, and λ 4302, which have been observed in the chromosphere, 4471 being as important as D_3 itself from the theoretical point of view to students of solar physics.

Whilst spectrum No. 4 was being photographed with the capillary tube end-on-wise, eye observations were made in another spectroscope directed sideways at it. I give from the Laboratory Note Book the observations I made while photograph No. 4 was being taken, to show that the yellow line was visible during the whole exposure.

Thursday, April 4, 1895. *Plate F. Exposure* 4.

10 minutes exposure.	4.42	Exposure started.
	4.43	Yellow line brightening up considerably.
	4.44	Suddenly as bright as hydrogen.
	4.45	Yellow line double.
	4.46	Comparison with D gives yellow line in position of D_3.
	4.47	Pump much less full, 7 c.c. of gas collected. Yellow line much brighter.
	4.48	Air break introduced. Line still visible, but very faint. Hydrogen lines getting brighter, and some double lines appearing in green.
	4-48.5	Air break and jar removed. Yellow line the only one seen, being as bright as C. Line in green the only other line visible.
	4.50	Replaced jar. Yellow brightening and the other lines more refrangible, brightening with it..
	4.51	Very bright. Steeple nearly full of gas.
	4.52	

The lines which appear both in the photographs of the capillary tube and of the gas collected over mercury are as follows. The lines indicated by an asterisk are near lines recorded in the chromosphere by Young or myself, or photographed during the eclipse of 1893:—

Micrometer reading.	Wave-length (Rowland).
3·2495	4581*
·2917	4523*
·2981	4513*
·3234	4479
.3316	4469·5*
·4146	4368
·5740	4196*
·5884	4181
·5933	4177*
·6139	4156*
·6176	4152·5*
·6262	4144*
·6290	4141

With regard to the observations in the visual spectrum, I have not found the uraninite gas to contain the argon lines as given by Mr. Crookes, nor, with the exception of the yellow line, do I get the special lines noted by him in the gas. (Four of these, out of six, seem possibly to be due to nitrogen.)

But I do get lines nearly coinciding with chromospheric lines discovered by me in 1868.

On November 6 of that year I suspected a line less refrangible than C, and so near it that when both were showing brilliantly the pair appeared double, like D in a spectroscope of moderate dispersive power.

Later I discovered another line at 6678·3 (R), which was observed to vary with D_3. There is a line in this position, with the dispersion employed, in the spectrum of the new gas. This line has also been seen by Thalén, as stated by Prof. Cleve in a communication to the Paris Academy (*Comptes rendus*. April 16, p. 835); but the other lines given by him (with the possible exception of the one at 5016), have not been recorded by me.

Although I have at present been unable to make final comparisons with the chromospheric lines, the evidence so far obtained certainly lends great weight to the conclusion that the new gas is one effective in producing some of them, and it is suggested by the photographs that the structure lines of hydrogen may be responsible for others.

I may state, under reserve, that I have already obtained evidence that the method I have indicated may ultimately provide us with other new gases the lines of which are also associated with those of the chromosphere.

Messrs. Fowler, Baxandall, Shackleton and Butler assisted at various times in the investigation.

---

[1] Preliminary Note, by J. Norman Lockyer, C.B., F.R.S.

NOTES.

We regret to report that Prof. Huxley is still in a critical state of health. The slight improvement noticed in his condition last week appears not to have been maintained. It is more than eight weeks since his illness began with an attack of influenza, from the effects of which he is now suffering.

M. Nordenskiöld has recently discovered a uranium containing mineral which may prove of great interest at the present time. It forms carbonaceous beds of which the ashes contain two to three per cent. of uranium, and, in addition, traces of nickel and rare earths. This uraniferous material is said to yield a considerable quantity of *nitrogen*.

Dr. Richard Hanitsch has been appointed Curator of the Raffles Museum at Singapore. Dr. Hanitsch has occupied for some years the post of Demonstrator of Zoology in University College, Liverpool, and is the author of a number of useful papers on the British Sponges.

The third centenary of Christian Huygens will shortly be reached; for that celebrated Dutch physicist, astronomer, and mathematician died at the Hague on June 8, 1695. His investigations have been reviewed at length in these columns during recent years, and *Die Natur* for April 21 contains a notice concerning them.

THE specimen of the Great Auk, to which we referred in these columns last week, has been sold to the Edinburgh Museum for £350.

DR. GORDON E. MOORE, well-known as a chemist, died at New York on April 16. Prof. Gustav Hirschfeld, a distinguished archæologist, has just died at Wiesbaden. We also notice the death of Prof. K. Thiersch, Professor of Surgery in Leipzig University.

PROF. LLOYD MORGAN will lecture on "Habits of Birds," at the Royal Victoria Hall, Waterloo Bridge Road, on May 7. Other science lectures to be given during this month are: "Electric Tram Cars," by Dr. J. A. Fleming, F.R.S.; "The History of a Myth," by Prof. Sollas, F.R.S.; and "The Life of a Star," by Dr. A. Fison.

GILBERT WHITE's original manuscript of the "Natural History of Selborne," in the form of letters to Thomas Pennant and Daines Barrington, first printed in 1789, was sold by auction last week by Messrs. Sotheby, Wilkinson, and Hodge. The manuscript contains many passages not printed in the several editions of the book, and has never been out of the possession of the lineal descendants of the author. It was bought by Mr. Pearson for £294.

THE *Weekly Weather Report* of April 27 shows that some very heavy falls of rain occurred during the week; in nearly all districts amounts of an inch or upwards were measured, while over the greater part of England the fall was more than double the mean. But the amount of rainfall since the beginning of the year is still below the average, except in the north-east of England. The greatest deficiency is in the west of Scotland, where it amounts to about seven and a half inches.

THE startling advance in market price of petroleum gives interest to the question of exhaustibility of the supply, following close upon the great decrease in supply of natural gas. In the height of the natural gas excitement, the warning of science was too little heeded, and lavish waste hastened the collapse. In 1887 the atmosphere of Pittsburgh was wonderfully clear, owing to the use of this new fuel; but Pittsburgh is again begrimed and sooty.

AT the annual meeting of the National Academy of Sciences, recently held at Washington, Prof. Marsh, who has been president for several terms, was succeeded by Prof. Wolcott Gibbs, of Cambridge, who was elected for the ensuing term of six years, while Prof. Asaph Hall was re-elected home secretary. Prof. Alexander Agassiz is foreign secretary, and the members of the Council elected are Profs. George J. Brush, Othniel C. Marsh, Benjamin A. Gould, George H. Goodale, Simon Newcomb, and Ira Remsen.

A THREE days' conference on sanitary progress and reform was held at Manchester last week. A meeting introductory to the conference was held in the museum of Owens College, at which Prof. Boyd Dawkins delivered an address on prehistoric traces of sanitation. At the annual meeting of the Manchester and Salford Sanitary Association, in connection with which the conference was held, it was resolved that a Smoke Abatement League should be formed. Sir H. Roscoe, who afterwards took the chair at the conference session, pointed out that though attention was paid to the smoke from factory chimneys and from manufacturing operations, the larger question of the smoke from ordinary household fires was often neglected.

A VERY serious disaster is reported from France. A dam holding in check an immense reservoir of the Eastern Canal at Bousey, near Epinal, broke down on Saturday morning for a distance of some 300 feet. The torrent of water thus set free swept through Bousey, Avière, Uxegney, and Sanchey, carrying all before it, and washed away portions of the railway lines of Jussey and Nancy. Many bridges were carried away, and a great number of people were drowned. The Bousey reservoir (says the Paris correspondent of the *Times*) contained seven million cubic metres of water. The dam, which was constructed between 1879 and 1884, and was strengthened in 1888-89, was 60 feet thick at the base, and the foundation is laid in sandstone. According to a report sent out by the Minister of Public Works, there have never been any signs of weakness in the structure. Attempts are being made to throw the responsibility for the accident upon the engineers who superintended the strengthening of the dam six years ago.

A NUMBER of interesting objects obtained during the excavations of the Roman city at Silchester are on view at the Society of Antiquaries. During the past five years, the excavations have been carried on by Messrs. St. John Hope, Fox, Jones, and Stephenson, and some very valuable results were obtained last year. Twelve rectangular enclosures or buildings were found, all of the same type, and containing furnaces obviously of an industrial character and of various sizes, some of them being circular and others oblong. It is believed that these buildings and their adjuncts were devoted to the dyeing industry, and this conjecture is made probable by the large number of wells discovered, one of which was of peculiar and unusual construction. The circular furnaces correspond exactly with a dyeing furnace at Pompeii. They were, there is every reason to believe, used for dyeing. But there are a number of other furnaces with a straight flue, which are supposed to have been intended for drying. There are also traceable several rooms which, it is presumed, were intended for the storage of goods and materials, and open spaces with no remains of flues which may have been used for bleaching grounds. A number of querns for hand-grinding the madder-roots used for dyeing purposes have also been discovered.

THE sixty-sixth anniversary meeting of the Zoological Society was held on Tuesday, with the President, Sir William H. Flower, K.C.B., F.R.S., in the chair. Dr. P. L. Sclater, F.R.S., read the report of the Council, in which it was announced that the silver medal of the Society had been awarded to Mr. Henry H. Johnston, C.B., H.M. Commissioner for British Central Africa, for his distinguished services to all branches of natural history by his collections made in Nyasaland, which had been described in the Society's *Proceedings*. The total receipts of the Society for 1894 amounted to £25,107 0*s*. 7*d*. The number of visitors to the Gardens during the year was 625,538, the corresponding number in 1893 having been 662,649; the decrease in the number of entrances (37,111) being due to the unfavourable weather of 1894. The number of animals in the Society's collection on December 31 last was 2563, of which 669 were mammals, 1427 birds, and 467 reptiles. Amongst the additions made during the past year, eleven were specially commented upon as of remarkable interest, and in most cases representing species new to the Society's collection. Among these were two remarkably fine specimens of the Hamadryad snake, a young white-tailed gnu (born in the Gardens), an eland of the striped form from the Transvaal (obtained by purchase), two giant tortoises, a young male Pleasant antelope, 2 Somali ostriches of the blue-skinned variety, 10 Surinam water-toads, a Pel's owl, and 2 tree kangaroos. About 30 species of mammals, 12 of birds, and 1 of reptiles had bred in the Society's Gardens during the summer of 1894. The Right Hon. George Denman, F. Du Cane Godman, F.R.S., Sir Hugh Low, G.C.M.G., Dr. St. George Mivart, F.R.S., and Osbert Salvin, F.R.S., were elected into the Council in the place of the retiring members, and Sir William H. Flower was re-elected President, Charles Drummond, Treasurer, and Dr. Sclater, Secretary, to the Society for the ensuing year.

The first of the two conversaziones held at the Royal Society every year, takes place as we go to press. Annual receptions and exhibits, conducted upon much the same lines, are gradually being instituted by learned societies in various parts of the world. The New York Academy of Sciences recently held a similar exhibition, at which five hundred different objects of scientific interest were shown. From a report in the *Scientific American*, it appears that many of the exhibits were of a very striking character. A number of photographs of comets, of the Milky Way, and of star spectra, were shown by Profs. Barnard and Keeler, of the Lick and Allegheny Observatories. One of the most novel exhibits in physics, was a series of Chladni figures, shown by Prof. Alfred M. Mayer. The figures were formed in white sand upon vibrating metallic plates. Prof. Mayer's process consisted in fixing the sand upon a black background after the figures had been formed, by means of a fixative spray. These plates demonstrated the truth of Lord Rayleigh's theoretical deductions, and differed radically from all figures which are shown in text-books in the fact that none of the lines intersect. The physical exhibit was an extensive one, including a large number of instruments for spectroscopic, as well as for sound and light, measurements. The mineralogical exhibit included about one hundred objects. Biology was represented by preparations of nerve cells from the brain and spinal cord, by Prof. Golgi's method; and there were also shown several series of similar pictures bearing upon problems of inheritance, both in animals and plants. Bacteriology, mechanics, physiology, experimental psychology, anatomy, geology, and palæontology all took part in the exhibition. In vertebrate palæontology, the main exhibit was that showing the evolution of the horse. The series connecting the oldest known horse of the Lower Eocene period with the modern horse was probably the most complete which has ever been brought together. The little four-toed horse, recently acquired by the American Museum of Natural History from the collection of Prof. Cope, of Philadelphia, was exhibited. Although fully matured, it is only 3½ hands high. The skull and limbs, nevertheless, display the characteristics of the horse. The teeth are short and simple; the limbs are scarcely larger in diameter than a good-sized pencil, and there are four toes, all resting upon the ground, in the fore-foot. A remarkable series of feet was also exhibited, giving all the stages between this four-toed horse and the modern one-toed animal. The reception at which the exhibits were shown was so successful that it has been decided to hold a similar one every year.

Dr. Bertram Windle contributes a paper to the *Journal of Anatomy and Physiology*, "On the effects of Electricity and Magnetism on development." The observations recorded were made on developing silkworms, trout, and chick embryos. In the case of the chick, the number of abnormally developed embryos was much greater in eggs incubated around the poles of a strong magnet than usual. With one exception all the malformations were associated with deficient development of the vascular area. Dr. Windle has not conclusively shown that this large proportion of abnormal embryos was actually due to the presence of the magnet; yet his results on the whole agree with those of Maggiorani, although certain points of difference were observed in the defective embryos. The eggs of the silkworm moth were found to develop quite normally in a strong magnetic field. An electric current passing through a tank in which trout ova had been placed, seemed to produce an arrest of development. Dr. Windle concludes from his own observations and those of other authors, "that electricity produces an arresting effect upon development," while it is "very doubtful whether a magnetic field has any definite effect upon development or not."

A recent number of *Comptes rendus* contains an interesting paper by M. Branly, on the rate of loss of an electric charge due to the effect of light in the case of badly-conducting bodies. When the source of illumination is a body heated to a dull red, it is the condition of the illuminating surface which plays the chief part in the phenomenon. The nature of the charged body seems to have no effect. In the case where the illumination is rich in highly refrangible rays, however, the case is quite different, and the chief results obtained are as follows:—A disc of wood or marble, polished or unpolished, shows a marked loss of electricity when illuminated. If the disc is negatively electrified, the loss is more rapid than if it is positively electrified; but the difference is very much less marked than is the case with metal discs, particularly if they are polished. Similar results are obtained with cardboard, terra-cotta, and glass heated to 100°. The loss of a positive charge is rapid, while that of a negative one is slow in the case of varnished wood, or wood coated with a thin layer of oil, paraffin or tallow. With a metal disc coated with tallow, the loss when negatively electrified is slow, while the loss when positively electrified is very rapid. If a disc of polished wood, in which the loss of a negative charge is more rapid than that of a positive one, though the difference is not very marked, has the surface covered with a thin coating of plumbago, the loss with a negative charge becomes much more rapid than with a positive one. A metal plate covered with grease only loses a negative charge very slowly, the rate of loss of a positive charge being rapid. If, however, a thin coating of copper filings is spread over the tallow by means of a sieve, the loss with a positive charge becomes much more rapid than with a negative one. If powdered aluminium is used in the place of copper, the rates of loss in the case of positive and negative charges become nearly equal.

The United States Department of Agriculture publishes, in *Bulletin* No. 6 of the Department of Vegetable Pathology, a detailed paper, by Mr. D. G. Fairchild, on the use of "Bordeaux Mixture," a preparation of copper sulphate and lime, as a fungicide; and the mode of treatment of a number of diseases of fruit-trees, corn-crops, and garden plants caused by fungi.

The ninth edition has just been issued of part 1 of the *London Catalogue of British Plants*, comprising the Phanerogamia, Filices, Equisetaceæ, Selaginellaceæ, Marsileaceæ, and Characeæ. The changes introduced in this edition represent the results of the field-work, the critical study of British plants, and the researches on nomenclature, made during the last nine years. It is now edited by Mr. F. J. Hanbury.

The part of the *Agricultural Gazette of New South Wales* for January 1895 is chiefly occupied by papers on practical agriculture and breeding. Four species of so-called mahoganies of New South Wales are described by Mr. J. H. Maiden, all species of *Eucalyptus*. The life-history of the *Phylloxera vastatrix*, and the injuries inflicted by it on the vine, are described at length by Mr. J. A. Despeissis, and are illustrated by a coloured plate and numerous woodcuts.

With the title *Allgemeine botanische Zeitschrift für Systematik, Floristik, und Pflanzengeographie*, a new monthly botanical journal has been started at Carlsruhe, under the editorship of Herr A. Kneucker. Its aim is especially to deal with the study of difficult groups of plants, diagnoses of species, critical forms and hybrids, geographical botany, and the results of the travels of botanists.

In the *Bulletin* No. 9 of the *Minnesota Botanical Studies* is an interesting article by Mr. A. P. Anderson, on the Grand Period of Growth in the Fruit of *Cucurbita pepo*. From the time of fertilisation to that of ripening, the development may be divided into three periods—a period of active and continuous increase from the time of pollination to the grand maximum; one of decline in the daily increase and rise in the daily decrease from the grand maximum to the beginning of ripening; and the ripening period. During this latter period an extended decrease, due to transpiration, lasting throughout the daily hours, was quickly followed by the maximum increase. At the time of the grand maximum the fruit gained 782 grammes in weight during twenty-four hours. The variations in length of the internodes occurred simultaneously with corresponding increase and decrease in the weight of the fruit.

THE Natural History Museum acquired last year some very remarkable corals, the largest weighing as much as fifteen hundred pounds. Two of these specimens have furnished Prof. Jeffrey Bell with subject for a note "On the variations observed in large Masses of *Turbinaria*," in the April *Journal* of the Royal Microscopical Society. The note is accompanied by two plates reproduced from photographs, and the point to which it directs attention is the considerable difference in size and form of the calicles in different portions of the same mass of coral. The plates show totally distinct forms comparatively close to one another, though the large mass, of which they represent parts, may be taken to be formed by a single species—*Turbinaria mesenterina*. The variability may, Prof. Bell points out, partly account for the difficulty which all students of corals have in determining specimens of the genus *Turbinaria*.

A YEAR ago the Board of Trinity College, Dublin, deposited in the Dublin Science and Art Museum the collection of weapons, &c., chiefly from the South Sea Islands, in their possession. A catalogue of the collection has now been prepared and published, with an introduction by Dr. V. Ball, the Director of the Museum. The collection has been known by common tradition as the "Cook Collection"; but a careful search has failed to bring to light direct evidence that the objects were really sent home by Captain Cook, though some of them are identical with objects figured in "Cook's Voyages." There is little doubt, however, about the reality of the association of the objects with the voyage, for the Minutes of the Board of Trinity College record that they were presented to the College in 1777 by Dr. Patten, who has been identified as the surgeon of the *Resolution* during Cook's second voyage. Part of the collection appears to have reached the College through the relatives of Captain King, who brought home the *Resolution* and *Discovery* after Captain Cook had been murdered. A brief statement as to other museums where collections of Cook's weapons are preserved, is given by Dr. Ball in the introduction to the catalogue. It is stated that in Great Britain the British Museum collection is the best in the world. Next to it in importance, in England, comes the collection in the Pitt-Rivers Museum. The Hunterian Museum in Glasgow University also contains some specimens, but how many is uncertain. So far as Dr. Ball has been able to ascertain, the museums on the continent which possess Cook collections are, arranged alphabetically, at Berne, Florence, Göttingen, Lausanne, Munich, Stockholm, and Vienna.

MESSRS. WILLIAM WESLEY AND SON have issued a very full catalogue of works on geology, offered for sale by them. The catalogue contains classified titles of more than two thousand different volumes, memoirs, and separate papers of interest to geologists. R. Friedländer and Söhn, Berlin, have sent us Nos. 1–5 of this year's *Naturæ Novitates*. Bibliographers well know that the lists form a good index to current scientific literature. We have also received a catalogue, from Felix L. Dames, Berlin, containing titles of works on the invertebrates.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*, ♀) from India, presented by Mr. Julius Scovell; a Pig-tailed Monkey (*Macacus nemestrinus*, ♀) from Sumatra, presented by Mr. D. Orville B. Dawson; three Maholi Galagos (*Galago maholi*) from South Africa, presented by Miss Van Beren; a Crowned Hawk Eagle (*Spizaetus coronatus*) from South Africa, presented by Dr. Schinland; an Antipodes Island Parrakeet (*Cyanorhamphus unicolor*) from Antipodes Island, New Zealand, presented by Sir Walter L. Buller; a Leopard Tortoise (*Testudo pardalis*), a Cape Viper (*Causus rhombeatus*) from South Africa, presented by Mr. J. E. Matcham; three Green Lizards (*Lacerta viridis*) from Jersey, presented by Masters J. S. and A. H. Hills; a Common Viper (*Vipera berus*) from Hampshire, presented by Mrs. P. C. Mitchell; two Angora Goats (*Capra hircus*, var.), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

SATURN'S RINGS.—In a recent communication to the Royal Astronomical Society, Prof. Barnard states that his measurements of the rings of Saturn show that no changes have taken place since the first systematic measures were made, and that there is no ground for the supposition that the rings are closing in upon the planet.

SEARCH EPHEMERIS FOR COMET 1884 II.—Dr. Berberich gives the following search ephemeris for Barnard's periodic comet of 1884 (*Ast. Nach.* 3260):

	R. A. h.	m.	s.	Decl. °	′
May 2	22	5	36	−18	24
10		35	16	15	38
18	23	3	54	12	40
26		31	20	9	35
June 3		57	26	6	27
11	0	22	7	3	22
19		45	20	−0	24
27	1	6	59	+2	25

The positions are for Berlin midnight, and the probable error amounts to 20m. in R.A. and 3° in decl. The comet passes from Aquarius to Cetus early in June, and remains in that constellation throughout the month. It must be looked for before sunrise.

THE HAMBURG OBSERVATORY.—From the report of the Hamburg Municipal Observatory we learn that the chief astronomical researches during 1894 had to do with the movements of comets and minor planets, and with the changes in variable stars of long period. Two memoirs of some importance have also been published (*Mitt. der Hamburger Sternwarte*, Nos. 1 and 2. 1895). The first of these is a catalogue of the positions of 105 nebulæ and star-clusters, reduced from observations made in the period 1871–1880, by Dr. Pechüle and the present director, Prof. G. Rümker. The positions have been deduced from micrometric measures in relation to known comparison stars, and are tabulated for the epoch 1875. Comparisons are made with the results of other observers, and, considering the difficulties attending the observations, there is a good all-round accordance of results; but it seems yet too early to expect much information with regard to proper motions. The second memoir is an investigation by Dr. Carl Stechert of the orbit of the minor planet Tycho (258) and of the perturbations produced by Jupiter and Saturn. It is shown that the probable apparent semi-diameter of the planet at opposition is about $0''.05$, the true semi-diameter being something between 50 and 80 kilometres. An ephemeris is given for observations during the opposition of June 20, 1895.

THE LATE M. TROUVELOT.—By the death of M. L. Trouvelot, on April 22, observational astronomy has lost one of its foremost workers. M. Trouvelot was born at Guyencourt, in 1827, and after the *coup d'état*, he went to Cambridge, U.S.A., where he lived until 1882. His first published works, which appeared in 1866, were on natural history subjects; later he became an astronomer at the Harvard College Observatory, and commenced the observations of the sun and planets which have made his name known to all students of celestial science. Shortly after the Meudon Observatory was founded, he returned to France, and has since then carried on his work in it. Trouvelot's important observations of the planet Venus, published in 1892, are still fresh in the minds of astronomers. He also paid attention to the planets Jupiter and Saturn. His beautiful drawings of celestial objects and phenomena observed by him are to be found in many works on astronomy.